

Notice of Allowability

Application No.

10/611,298

Examiner

Sang Nguyen

Applicant(s)

JOHNSON, KENNETH C.

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 07/01/03.
2. ☒ The allowed claim(s) is/are 1-13.
3. ☒ The drawings filed on 01 July 2003 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

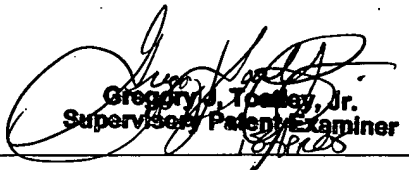
* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 09/08/03
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 04/15/05.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


Gregory S. Trosley, Jr.
Supervisory Patent Examiner

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Michael A. Stallman Reg. No. 29,444 on April 15, 2005.

The application has been amended as follows:

In claim 6, line 21; delete "**first**" and replaced by **–second–**.

In claim 11, line 12; adding "**a reduced multicubic with**" before the "a polynomial function".

In claim 11, line 13; adding "**the reduced multicubic**" after "with the polynomial".

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance:

The prior art does not show or suggest the claimed method. The instant specification set forth the method of the application being useful for inspecting a semiconductor wafer by using a reduced multicubic interpolation function being substantially continuous and matching the theoretical optical response characteristic at each interpolation point (see, for instance, pages 6-8).

As to independent claims 1 and 11 are allowable over the prior art for at least the reason that the prior art of record, taken alone or in combination, fails discloses or

render obvious a method for optical inspecting a semiconductor wafer comprising all the specific elements with the specific combination including of the interpolated response characteristic is calculated using a reduced multicubic function in which all derivative terms are simple with the reduced multicubic function being substantially continuous and substantially matching the theoretical optical response characteristic at each interpolation point in combination with the rest of the limitation of claims 1 and 11.

As to independent claim 6 is allowable over the prior art for at least the reason that the prior art of record, taken alone or in combination, fails discloses or render obvious a method of evaluating a sample comprising all the specific elements with the specific combination including of comparing being repeated until a best fit parameter set is identified as the measured parameter values of the sample, wherein the number of database quantities used for the computation at each interpolation parameter set is less than 4^N , where N is equal to the number of parameters and where the interpolation point accuracy order is higher than second-order in combination with the rest of the limitation of claim 6.

As to independent claim 8 is allowable over the prior art for at least the reason that the prior art of record, taken alone or in combination, fails discloses or render obvious a method for optical inspecting a semiconductor wafer comprising all the specific elements with the specific combination including of retrieving the interpolation points corresponding to each vertex of the interpolation cell and using the retrieved interpolation points to evaluate a reduced multicubic function in which all derivative terms are simple in combination with the rest of the limitation of claim 8.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chang et al (6867866) discloses CD metrology analysis using; Green's function; Johnson et al (6768967) discloses database interpolation method for optical measurement of diffractive microstructure; Scheiner et al (6476920) discloses method and apparatus for measuring of patterned structure; Cherkassky (6242739) discloses method and apparatus for non destructive determination of film thickness; Ito et al (5905822) discloses interpolation operation method and apparatus for image signals; or Ziger (5607800) discloses method and arrangement for characterizing micro-size patterns.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sang Nguyen whose telephone number is (571) 272-2425. The examiner can normally be reached on 9:30 am to 7:00 pm.

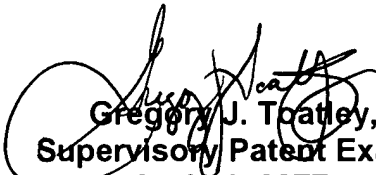
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on (571) 272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SN

Sang Nguyen/SN

April 15, 2005


Gregory J. Toatley, Jr.
Supervisory Patent Examiner
Art Unit 2877
Technology Center 2800
18 April 2005